

REMARKS

This is a full and timely response to the outstanding Office Action mailed March 6, 2006. Upon entry of the amendments in this response, claims 1 – 4, 6 – 9, 11 – 22, 38 – 40, 42 – 51 and 53 – 66 remain pending, with claims 24 – 30 and 56 – 61 having been withdrawn. In particular, Applicant has amended claims 1, 2, 32, 33 and 40, claims 2, 33 and 40 having been amended to correct minor informalities. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

Indication of Allowable Subject Matter

The Office Action indicates that claims 63 and 66 would be allowable if rewritten in independent form and to overcome the rejections under 35 U.S.C. 112 indicated in the Action. Although agreeing that these claims contain allowable subject matter, Applicant respectfully asserts that these claims are in condition for allowance for at least the additional reason that each of these claims depends from an allowable independent claim as discussed in detail below.

Election/Restriction Requirement

The Office Action indicates that claims 24 – 30 and 55 – 61 are withdrawn from further consideration pursuant to 37 C.F.R. 1.142(b). However, Applicant respectfully asserts that the remaining independent claims are generic. Therefore, Applicant respectfully requests consideration of the previously restricted claims as being allowable for at least the reason that these claims are dependent claims that incorporate the limitations of their respective independent claims.

Rejections Under 35 U.S.C. §112, First Paragraph

The Office Action indicates that claims 1, 2, 6, 8, 9, 11 – 18, 20 and 21 are rejected under 35 U.S.C. 112, first paragraph. In particular, the Office Action indicates that the limitation,

. . . wherein the containment portion and the unit which accelerates the melt material are operative to prevent the melt material from being ejected from the containment portion due to the acceleration force; and

wherein, while the melt material is experiencing the acceleration force, liquid droplets of the melt material become entrained in the atomizing fluid flowing across the exposed surface of the material such that at least some of the liquid droplets aerosolize and are ejected from the containment portion.

is not supported by the original disclosure. Applicant respectfully traverses.

In this regard, Applicant notes that three basic portions of the language of claim 1 allegedly are not supported by the original disclosure; namely, 1) the portion pertaining to the containment of the melt; 2) the portion pertaining to entraining by the atomizing fluid; and 3) ejecting liquid droplets from the containment. Each of these portions will be described separately below.

With respect to support for containment of the melt, the following representative teachings of Applicant's disclosure are presented:

1. An atomizer system comprising: a) a melt material to be atomized; b.) *a containment portion for securing the melt material*; c.) *a unit which accelerates the environment of the melt material such that the gravitational forces experienced by the melt material are elevated relative to Earth's standard gravitational force*; and d.) atomizing fluid that flows across an exposed surface of the melt material facilitating the establishment of liquid droplets that aerosolize and create fine particulates.

(Original Claim 1). (Emphasis Added).

40. The atomizer method of claim 32 further comprises *the step of containing the melt material with a containment portion* made of a solid form of the melt material itself.

(Original Claim 40). (Emphasis Added).

[0057] Furthermore, FIG. 1 depicts a variety of these drop formation techniques from an operational standpoint. *A support unit 20 physically contains a melt material 22 such that an upper surface 24 of the melt material 22 may be exposed to an atomizing fluid 26.* As the atomizing fluid 26 passes across the surface 24 of the melt material 22, bubbles 18 contained within the melt material 22 migrate toward and ultimately burst through the surface and form drops of the specific types described above.

(Specification at paragraph [0057]). (Emphasis Added).

Based on the foregoing representative teachings of Applicant's disclosure, Applicant respectfully asserts that the present claim language relating to containment of the melt is fully supported. That is, one of ordinary skill in the art upon reading Applicant's original disclosure would understand the metes and bounds of the subject matter presently claimed.

With respect to support for entraining by the atomizing fluid, Applicant has used the term "entrained" in accordance with its common and ordinary meaning, which means to draw into a moving fluid and carry along. In this case, Applicant has taught embodiments in which liquid droplets are entrained in an atomizing fluid that flows across an exposed surface of the material while the melt material is experiencing the acceleration force. Notably, the melt material over which the atomizing fluid flows must be within the containment, else the melt is not experiencing the elevated acceleration.

In this regard, the following representative teaching of Applicant's disclosure are presented:

[0082] The atomizing fluid velocity 70 will contain both axial--along the axis of rotation--and rotational components. It should be understood and appreciated that the angular velocity of the atomizing fluid is independent of the angular velocity of the containment. In accordance with the embodiments of the present invention, it is set at the discretion of the user. Such freedom permits some control over the extent of particulate re-entry into the melt. *This is because the acceleration seen by the aerosol is independent of the containment acceleration and large particles move preferentially in a viscous medium (atomizing fluid) when subject to acceleration.*

(Specification at paragraph [0082]). (Emphasis Added).

Clearly, the aforementioned passage of Applicant's disclosure relates that the particles are entrained by the atomizing fluid. Additionally, reference is made to FIG. 6, which depicts

atomizing fluid 70 flowing over the melt material to entrain a liquid droplet 84. Therefore, Applicant respectfully asserts that the present claim language relating to entraining by the atomizing fluid is fully supported. That is, one of ordinary skill in the art upon reading Applicant's original disclosure would understand the metes and bounds of the subject matter presently claimed.

With respect to support for ejecting liquid droplets from the containment, Applicant has used the term "ejecting" in accordance with its common and ordinary meaning, which means to put out or expel from. In this case, Applicant has taught embodiments in which liquid droplets are entrained in an atomizing fluid and carried away from the containment that originally subjected the melt to elevated acceleration.

In this regard, the following representative teachings of Applicant's disclosure are presented:

1. An atomizer system comprising: a) a melt material to be atomized; b.) a containment portion for securing the melt material; c.) a unit which accelerates the environment of the melt material such that the gravitational forces experienced by the melt material are elevated relative to Earth's standard gravitational force; and d.) ***atomizing fluid that flows across an exposed surface of the melt material facilitating the establishment of liquid droplets that aerosolize and create fine particulates.***

(Original Claim 1). (Emphasis Added).

[0096] ***Step F, generally depicted herein as reference numeral 120, simply states and acknowledges that at least some of the drops produced aerosolize.*** Additionally, Step G, generally depicted herein as reference numeral 122, sets forth the fact that quickly after atomization the molten material seeks a minimum surface energy and the particle becomes spherical. Simultaneously the particle cools toward local temperature conditions through convection, conduction, and radiation heat transfer.

(Specification at paragraph [0082]). (Emphasis Added).

[0097] ***Step H, generally depicted herein as reference numeral 124, depicts that once the atomizing fluid and atomized material have been removed from the atomizer the two must be separated.*** This separation can be achieved through any number of well-known and accepted existing technologies, such as those used in the pollution abatement industry.

(Specification at paragraph [0082]). (Emphasis Added).

Clearly, the above teachings indicate that the liquid droplets are entrained in an atomizing fluid and carried away from the containment. This is also evident in a contrasting teaching that indicates some droplets may re-enter the melt within the containment. In particular, see paragraph [0094] which discloses:

[0094] It may be advantageous to briefly discuss each of these options. First, as denoted by Step E1 (generally depicted herein as reference numeral 114), *if the droplets are ejected sufficiently far from the melt and are small enough that the atomization fluid viscosity is sufficient to prevent the particle from returning to the melt then atomization has been achieved*. Secondly, as denoted by Step E2 (generally depicted herein as reference numeral 116), if each of the aforementioned circumstances is not met then the particle may return to the melt, whereby upon impact with the melt, causing splatters. Lastly, as denoted by Step E3 (generally depicted herein as reference numeral 118), in those circumstances where the Weber number is sufficient, the particle(s) may subsequently be subjected to secondary atomization while immersed in the atomization fluid.

(Specification at paragraph [0094]). (Emphasis Added).

Based on the foregoing representative teachings of Applicant's disclosure, Applicant respectfully asserts that the present claim language relating to ejecting liquid droplets from the containment is fully supported. That is, one of ordinary skill in the art upon reading Applicant's original disclosure would understand the metes and bounds of the subject matter presently claimed. Therefore, for at least the foregoing reasons, Applicant respectfully requests that the rejection under 35 U.S.C. 112, first paragraph, be removed.

Rejections Under 35 U.S.C. §112, Second Paragraph

The Office Action indicates that claims 32, 33, 35, 39, 40, 42 – 51, 53, 54, 62 and 66 are rejected under 35 U.S.C. 112, second paragraph. Applicant respectfully traverses. In particular, Applicant has amended claim 32 to indicate that the material is a melt material. Therefore, Applicant respectfully asserts that the rejection has been rendered moot.

Rejections Under 35 U.S.C. §102

The Office Action indicates that claims 1, 2, 4, 6, 8, 9, 11 – 18, 20 - 22, 31 - 33, 35, 39, 40, 42 – 49, 51, 53, 54, 62, 64 and 65 are rejected under 35 U.S.C. 102 as being anticipated by *Roberts*. The Office Action also indicates that claims 1, 2, 4, 6, 8, 9, 15, 16 - 18, 20 - 22, 32, 33, 35, 39, 40, 46 – 49, 51, 53, 54 and 64 are rejected under 35 U.S.C. 102 as being anticipated by *Gow*. Applicant respectfully traverses the rejections.

With respect to *Roberts*, *Roberts* teaches two systems of interest as depicted in FIGs. 3 and 4 therein. In this regard, FIG. 3 of *Roberts* discloses a system in which melt is gravity fed to a platform, which is rotated. When the acceleration forces on the melt are sufficient to overcome surface tension forces, the melt is broken into particles that are flung off the platform. In the distinct embodiment of FIG. 4 of *Roberts*, melt is gravity fed between streams of gas that separate the melt into particles. Notably, there is no teaching or suggestion in *Roberts* to combine the aforementioned embodiments as appears to have been done in the Office Action. For this reason alone, the pending rejections under *Roberts* appear to be improper and should be removed.

With respect to *Gow*, that reference involves principles similar to the first embodiment of *Roberts* in which a melt is broken into particles that are flung off a platform when acceleration forces on the melt are sufficient to overcome surface tension forces. In contrast to *Roberts*, however, the particles are captured by a liquid that is spaced from the platform. Thus, the fluid does not flow across the material as the material is experiencing the acceleration forces.

Referring now to the claims, Applicant has amended claim 1 to recite:

1. An atomizer system comprising:
a melt material to be atomized;
a containment portion for securing the melt material;
a unit which accelerates the melt material such that the melt material experiences an acceleration force higher than Earth's standard gravitational force; and
atomizing fluid that flows across an exposed surface of the melt material, **the exposed surface of the melt material being located within the containment portion;**
wherein the containment portion and the unit which accelerates the melt material are operative to prevent the melt material from being ejected from the containment portion due to the acceleration force; and
wherein, while the melt material is experiencing the acceleration force, liquid droplets of the melt material become entrained in the atomizing fluid flowing across the exposed surface of the material such that at least some of the liquid droplets aerosolize and are ejected from the containment portion.

(Emphasis added).

Applicant respectfully asserts that *Roberts* and *Gow* are legally deficient for the purpose of anticipating claim 1. In particular, Applicant respectfully asserts that neither of these references teaches or otherwise discloses at least the features/limitations emphasized above in claim 1.

Specifically, with respect to *Roberts*, *Roberts* does not teach or otherwise disclose “wherein the containment portion and the unit which accelerates the melt material are operative to prevent the melt material from being ejected from the containment portion due to the acceleration force.” That is, in the embodiment of FIG. 3, acceleration forces cause the melt to be ejected from the containment portion and, in the embodiment of FIG. 4, there are no acceleration forces that exceed that of gravity. Additionally, *Roberts* does not teach or otherwise disclose “wherein, while the melt material is experiencing the acceleration force, liquid droplets of the melt material become entrained in the atomizing fluid flowing across the exposed surface of the material such that at least some of the liquid droplets aerosolize and are ejected from the containment portion.” This is clearly the case since Applicant has

further recited “the exposed surface of the melt material being located within the containment portion.” That is, in the embodiment of FIG. 3, the liquid droplets do not become entrained in the atomizing fluid (particularly because there is no atomizing fluid as recited in claim 1) and, in the embodiment of FIG. 4, there are no acceleration forces. Therefore, Applicant respectfully requests that the rejections under *Roberts* be removed.

With respect to *Gow*, *Gow* does not teach or otherwise disclose “wherein the containment portion and the unit which accelerates the melt material are operative to prevent the melt material from being ejected from the containment portion due to the acceleration force.” That is, *Gow* specifically teaches that the acceleration forces cause the melt to be ejected from the containment portion. Additionally, *Gow* does not teach or otherwise disclose “wherein, while the melt material is experiencing the acceleration force, liquid droplets of the melt material become entrained in the atomizing fluid flowing across the exposed surface of the material such that at least some of the liquid droplets aerosolize and are ejected from the containment portion.” This is clearly the case since Applicant has further recited “the exposed surface of the melt material being located within the containment portion.” That is, in *Gow*, the liquid droplets do not become entrained in the atomizing fluid due to atomizing fluid flowing across the melt within the containment portion. In direct contrast *Gow* involves a fluid that entrains the liquid droplets after the droplets have been flung from the containment portion. Therefore, Applicant respectfully requests that the rejections under *Gow* be removed.

Based on the foregoing, Applicant respectfully asserts that claim 1 is in condition for allowance. Since claims 2 - 4, 6 - 9, 11 – 22 and 31 are dependent claims that incorporate all the features/limitations of claim 1, Applicant respectfully asserts that these claims also are in condition for allowance. Additionally, these claims recite other features/limitations that can serve as an independent basis for patentability. Furthermore, claims 24 – 30, 64 and 65 also

are dependent claims that incorporate all the features/limitations of claim 1, although these claims are presently withdrawn. Thus, upon allowance of claim 1, Applicant respectfully requests that these claims be reinstated and placed in condition for allowance.

With respect to claim 32, Applicant has amended that claim to recite:

32. A method of atomizing a melt material comprising the steps of:
accelerating the melt material to be atomized;
flowing an atomizing fluid across an exposed surface of the material
while the exposed surface of the material is experiencing an acceleration
force higher than Earth's standard gravitational force; and
while the exposed surface of the material is experiencing the
acceleration force, entraining liquid droplets of the material in the
atomizing fluid flowing across the exposed surface of the material such that
the liquid droplets aerosolize and create fine particulates.

(Emphasis added).

Applicant respectfully asserts that *Roberts* and *Gow* are legally deficient for the purpose of anticipating claim 32. In particular, Applicant respectfully asserts that *Roberts* does not teach or otherwise disclose at least the features/limitations emphasized above in claim 32.

Specifically, with respect to *Roberts*, *Roberts* does not teach or otherwise disclose “flowing an atomizing fluid across an exposed surface of the material while the exposed surface of the material is experiencing an acceleration force higher than Earth's standard gravitational force” and “while the material is experiencing the acceleration force, entraining liquid droplets of the material in the atomizing fluid flowing across the exposed surface of the material such that the liquid droplets aerosolize and create fine particulates that are not contained by the containment portion.” Notably, once the material leaves the containment of *Roberts*, the material is no longer experiencing the acceleration forces as recited in claim 32. Thus, even if the teachings of the two distinct embodiments of *Roberts* are combined, that combination does not involve entraining while the elevated acceleration is present as is

generally recited in claim 32. Therefore, Applicant respectfully requests that the rejection of claim 32 under *Roberts* be removed.

With respect to *Gow*, *Gow* does not teach or otherwise disclose “flowing an atomizing fluid across an exposed surface of the material while the exposed surface of the material is experiencing an acceleration force higher than Earth's standard gravitational force” or “while the exposed surface of the material is experiencing the acceleration force, entraining liquid droplets of the material in the atomizing fluid flowing across the exposed surface of the material such that the liquid droplets aerosolize and create fine particulates.” That is, *Gow* is not involved with flowing an atomizing fluid across an exposed surface of the material as recited in claim 32, because the fluid of *Gow* flows across the liquid droplets, which are not experiencing acceleration higher than gravity. *Gow* also is not involved with entraining liquid droplets of the material in an atomizing fluid flowing across the exposed surface of the material, because the fluid of *Gow* is used to capture liquid droplets after the droplets are created. Therefore, Applicant respectfully requests that the rejections under *Gow* be removed.

Based on the foregoing, Applicant respectfully asserts that claim 32 is in condition for allowance. Since claims 33 - 35, 38 - 40, 42 - 51, 53 and 54 - 62 are dependent claims that incorporate all the features/limitations of claim 32, Applicant respectfully asserts that these claims also are in condition for allowance. Additionally, these claims recite other features/limitations that can serve as an independent basis for patentability. Furthermore, claims 56 - 62 also are dependent claims that incorporate all the features/limitations of claim 32, although these claims are presently withdrawn. Thus, upon allowance of claim 32, Applicant respectfully requests that these claims be reinstated and placed in condition for allowance.

Rejections Under 35 U.S.C. §103

The Office Action indicates that claims 19 and 50 are rejected under 35 U.S.C. 103 as being unpatentable over *Roberts* in view of *Slaughter*. Applicant respectfully traverses the rejections. In particular, claims 19 and 50 are dependent claims that incorporate all the features/limitations of claims 1 and 32 respectively. Since *Slaughter* does not teach or reasonably suggest the limitations above that have been shown to be lacking in *Roberts*, Applicant respectfully asserts that the combination of *Roberts* and *Slaughter* is likewise deficient for rendering the claims unpatentable. Therefore, Applicant respectfully asserts that these claims are in condition for allowance.

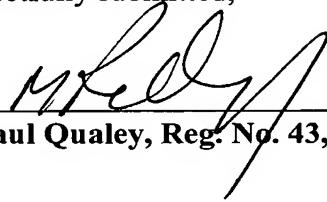
Cited Art Made of Record

The cited art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

Respectfully submitted,

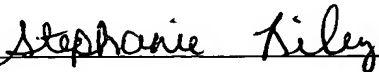


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